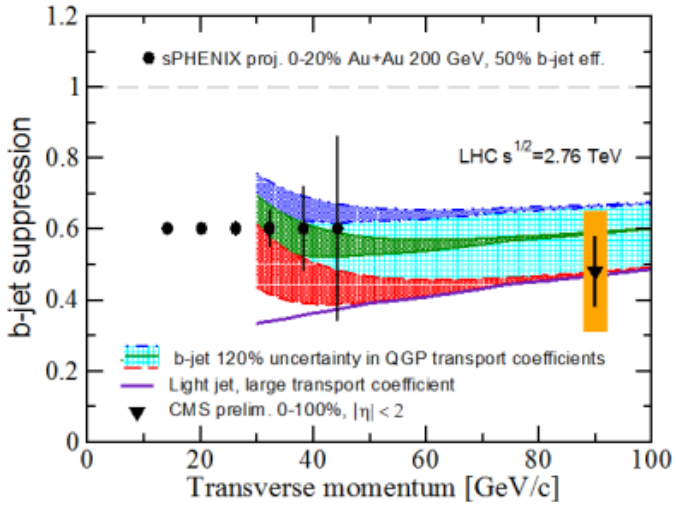
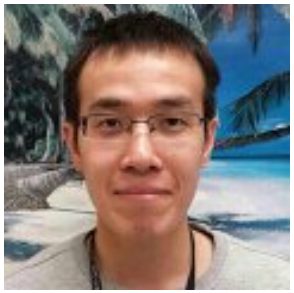
Overview



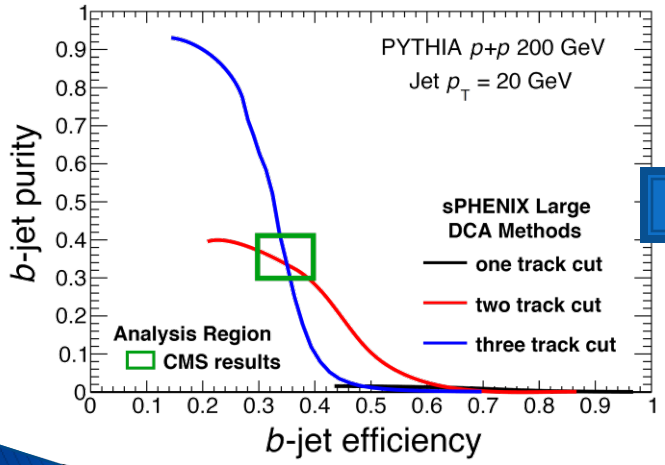
- Target B-jet tagging performance plots
  - High DCA track counting : Established G4-based procedure in p+p
  - Secondary vertex: Developed RAVE based secondary vertex finder. Results in p+p
  - **Next**: Reevaluate tagging in central Au+Au embedded events and pile up
  - Unifying truth definition and jet sample generations
    - Based on Dennis' work defining a truth tagging module run on MB events to synchronize B-jet definition and yield between analyzers
    - Available on GitHub: https://github.com/sPHENIX-Collaboration/analysis/tree/master/HF-Jet/TruthGeneration
- Regular updates on B-tagging simulation utilizing weekly simulation meetings: https://indico.bnl.gov/categoryDisplay.py?categId=88

B-jet tagging – High DCA track counting

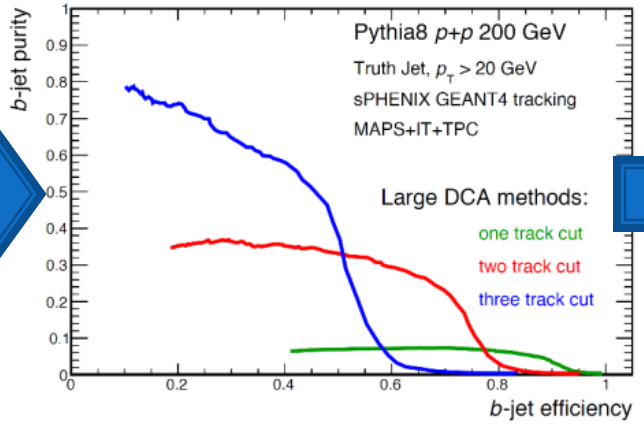
- Progress since last general meeting
  - Dennis and Haiwang implemented track counting tagger in the full Geant4 simulation
  - Haiwang produced projection plot in
- On-going past few weeks
  - Systematically validating the Geant4-based track fit procedure, in order to optimize 3-D DCA and likelihood
- Next
  - Reevaluate in HI background with HIJING embedding



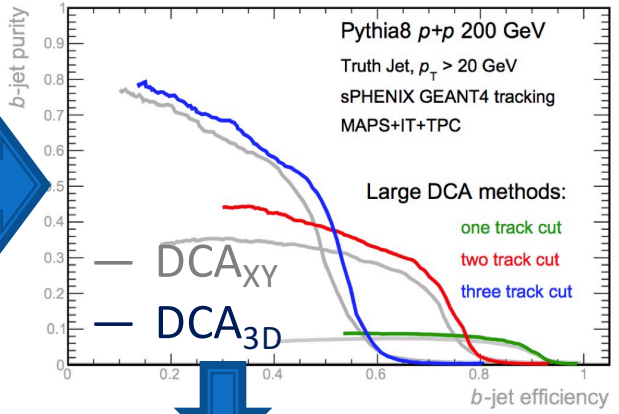
Fast sim in Proposal



Full Geant4 Sim in G4 (DCA_{XY})



Exploring 3-D DCA in G4
NOT optimal tune yet!

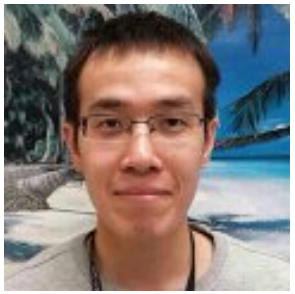


From Haiwang's talk
https://indico.bnl.gov/conferenceDisplay.py?confId=1926

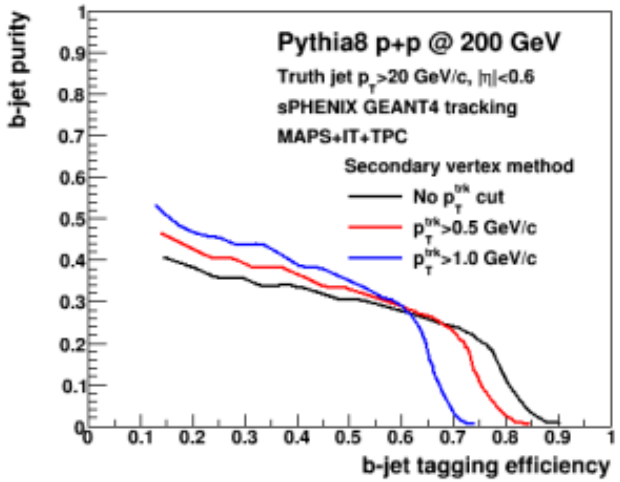
b-tagging performance in HI

B-jet tagging – Secondary vertex

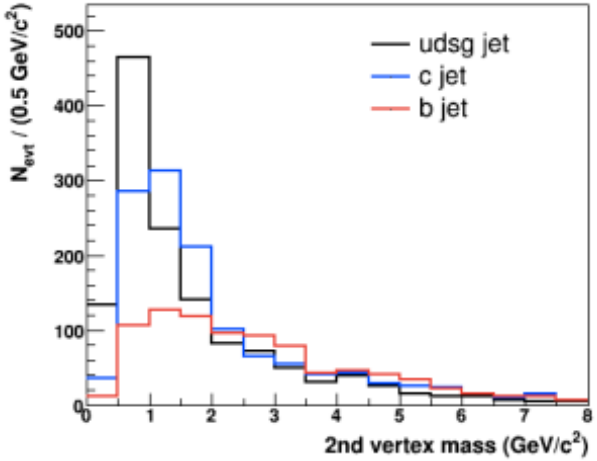
- Progress since last general meeting
  - Haiwang developed new Kalman filter (GenFit2) with vertex finder integration (RAVE)
  - Sanghoon implemented Secondary vertex finder in jet
  - p+p performance plot used in tracking review
- Plan next:
  - Reevaluate in HI background with HIJING embedding



Secondary vertex b-tagger



Secondary vertex kinematics fits
Data driven b-jet purity estimation



From Sanghoon's talk
https://indico.bnl.gov/conferenceDisplay.py?confId=1928

b-tagging performance in HI

From previous meetings

High priority longer-term tasks

- Goal: realistic study of HF jet performance in sPHENIX simulation and reconstruction.
- Target time scale: tracking review
- High priority development tasks (help wanted):
  - Realistic implementation in Geant4
    - Tony F./Gaku M./Chris P., lots of progress
  - Generalized Kalman filter
    - Haiwang Y./Chris P., close to completion
  - Multi-vertexing/B-tagging via secondary vertexing in jet
    - Sanghoon L./Haiwang Y.: exploring RAVE option
  - B-jet tagging: Track Counting
    - Dennis P.: lots of progress in past weeks
  - B-jet tagging: Soft Lepton Tagging
    - Jin H. (+ Help)
  - B-quark jet selection: B-Meson Tagging
    - Volunteer needed!